

Application No.: 10/556,233
Response dated January 23, 2008
Applicants' Response to the Office Action dated July 23, 2007

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REMARKS

The instant Application is directed to a process for the production of a benzoic acid ester by the reaction of benzoic acid or a benzoic acid ester, such as benzoic acid methyl ester, with one or more alcohols, such as natural or synthetic, saturated or unsaturated, branched or unbranched alcohols, including C₆-C₂₂-, preferably C₈-C₁₈-, more preferably C₁₂-C₁₅-fatty and/or hydroxyfatty alcohols, preferably linear primary alcohols, more preferably ethoxylated and/or propoxylated alcohols and/or glycols, preferably in a molar excess of alcohol(s) of 10-30% over the benzoic acid component, with a catalyst of, e.g., 0.01-0.6%, by weight, of tin (II) oxide and 0.02-1%, by weight (both based on the benzoic acid component), of a phosphorus (I) compound, preferably selected from phosphorus (I) acid or a salt thereof, with heating (e.g., 150°-290°C, preferably 200°-240°C), in a first step, under normal pressure, with a majority of the tin oxide added at, for example, between 150° and 190°C, after the reactants have been combined, then progressed, in a second step, under reduced pressure (e.g., ca.200mbar) at either the same or a different elevated temperature, and completed, in a third step, in a vacuum at the same or a different elevated temperature, which leads to high conversion levels and high yields of a very pure benzoic acid ester, with a low acid value, that can generally be used, after removal of excess alcohol by distillation and precipitation of the esterification catalyst with, e.g., phosphoric acid, without further purification steps, making it quite suitable for use in cosmetic preparations.

Rejections under 35 USC §103(a)

Claims 19-42 have been rejected under 35 USC §103(a), as unpatentable over Walele *et al* (U.S. Patent 5,959,130) in view of Williams *et al*. (U.S. Patent 3,972,962).

United States Patent 5,959,130 (Walele *et al*), which distinguishes itself from U.S. Patent 2,182,397 (Eckey), relates to benzoic acid esters of castor oil and hydrogenated castor oil, and double esters of ricinoleic acid and 12-hydroxy stearic acid, which esters and double esters are produced by the reaction of benzoic acid on the hydroxyl group of the castor-based fatty acid backbone in the form of castor oil or

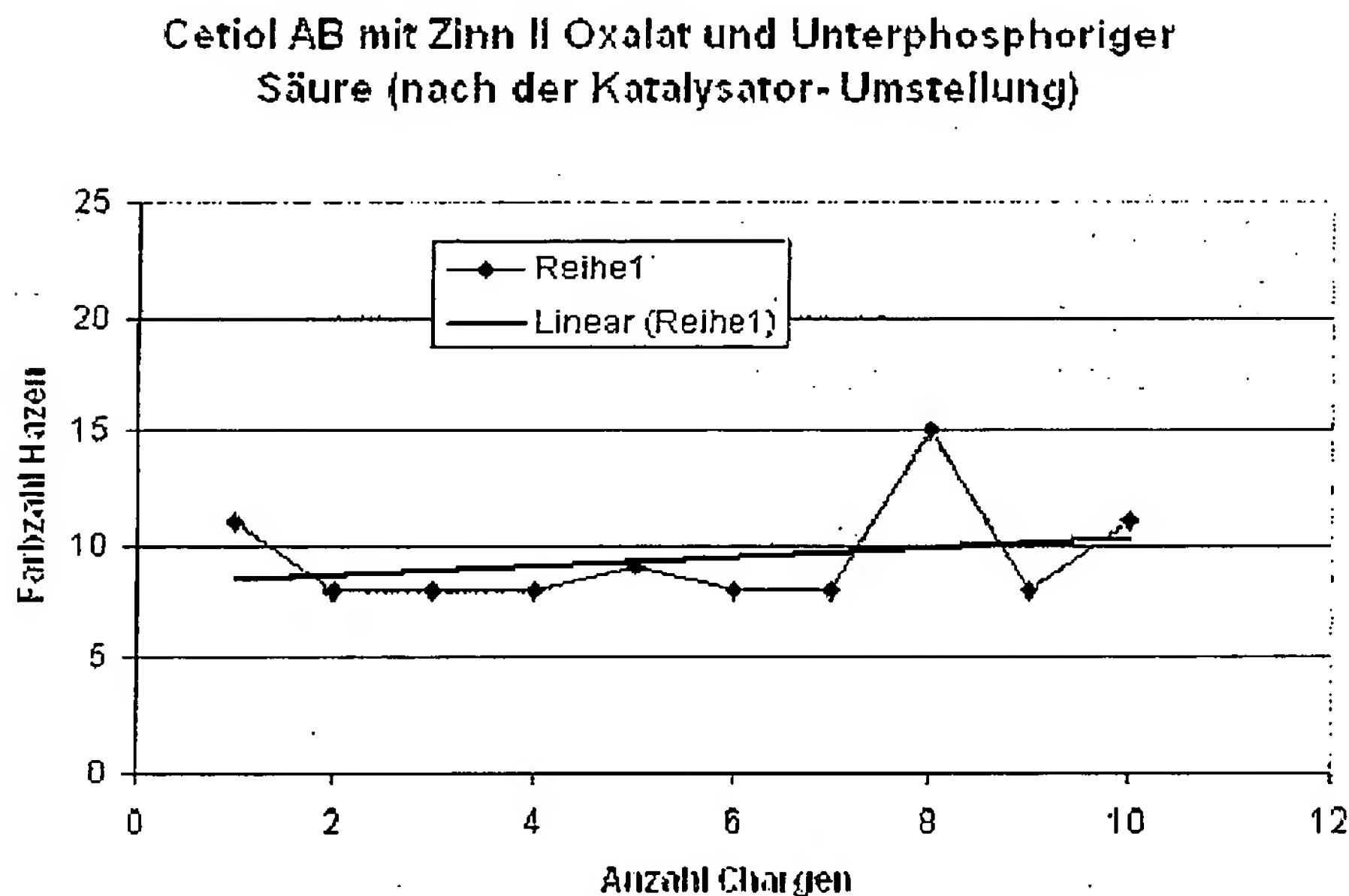
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hydrogenated castor oil or the fatty alkyl esters of ricinoleic acid or hydroxyl stearic acid, with stannous oxalate as a catalyst, and intended for use as from about 1% to about 20% of cosmetic and toiletry formulations.

The castor-based benzoate ester compositions of the reference, prepared using a tin oxalate esterification catalyst, rather than the combination catalyst of the instant invention, would result in a darker, and, therefore, less cosmetically-appealing, product than the water-clear products of the instant invention. When benzoic acid esters were prepared in ten experiments using tin (II) oxalate with phosphinic acid as the catalyst, a graph of the resulting products (shown as diamonds on the graph):



showed that the resulting esters had a median color index (from the ordinate values) of 9, as compared with the same ten experiments conducted with tin (II) oxide and phosphinic acid as the catalyst, according to the instant invention, which resulted in esters having a median color index of 5. Clearly the reference neither discloses nor makes obvious the instant invention.

United States Patent 3,972,962 (Williams *et al.*) discloses readily-processable and PVC-compatible, but non-migrating, chain-terminated polyester plasticizers for

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polyvinyl chloride homopolymers and copolymers, which plasticizers have an average molecular weight between about 1,500 and 10,000, preferably about 2,000 and 5,000, and are obtained from a particular combination and proportion of reactants in the conventional esterification of a C₄-C₁₂-, preferably a C₆-C₁₀-, aliphatic saturated dicarboxylic acid, preferably an alpha-omega alkanedioic acid, possibly including the corresponding acid anhydride, a 24-or-more per cent excess of a C₄-C₁₀-branched-chain dihydric alcohol with primary and secondary hydroxyl groups, 3-15 mole% of a C₇-C₂₀ monobasic aromatic acid, such as benzoic acid or a C₁-C₄-alkyl-substituted benzoic acid, as a chain terminator. 0.1 to about 1.0% of catalysts, such as phosphoric acid, sulfuric acid, p-toluene sulfonic acid, methane sulfonic acid, stannous oxalate, alkyl tin oxides, tetrabutyl titanate, zinc acetate, sodium carbonate and the like are used.

While the Williams *et al* reference is not limited to using a tin oxalate catalyst in its esterification reactions, it does not disclose or suggest Applicants' specific catalysts either. At column 4, lines 36-39, the reference lists phosphoric acid (with an oxidation status of 5, and which would not work with tin oxide as a catalyst, rather than Applicants' phosphorus (I) compounds [e.g., phosphinic or hypophosphorous acids]), and alkyl tin oxides, rather than Applicants' tin oxide, as its esterification catalysts. Clearly the Williams *et al* reference neither itself discloses nor makes obvious the instant invention, and it does not cure the deficiencies of the Walele *et al* reference.

Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 19-42 have also been rejected under 35 USC §103(a) as unpatentable over Eckey (U.S. Patent 2,182,397) in view of Williams *et al*. (U.S. Patent 3,972,962).

United States Patent 2,182,397 (Eckey) relates to a process for forming ether derivatives of a polyhydric alcohol, including those with esterified C₈-C₂₂-fatty acid groups, comprising reacting, in a solvent that solubilizes both reactants, one or more (preferably C₈-C₂₂) carboxylic fatty acid, selected from among possibly benzoic acid, phthalic anhydride and fumaric acid, with a polyhydric alcohol, such as glycerol and ethylene, propylene, trimethylene and other glycols, in proportions such that the acid esterifies only a portion of the hydroxyl groups of the alcohol, then converting some or all of the unesterified hydroxyl groups to ether groups, under lower temperatures (to

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avoid partial decomposition of the polyhydric alcohol) and other suitable conditions, including 0.05 to 1% of an esterifying catalyst, such as sulfuric acid or certain sulfonic acids, by combining other hydroxyl groups from other alcohol molecules, with the elimination of water.

The Eckey reference substitutes, as its "most suitable" esterification catalysts for the first part of the process to which it relates, at page 2, second column, lines 51-53, sulfonic acid and certain aromatic sulfonic acids, none of which disclose or remotely suggest the beneficial catalysts of the instant invention.

And again, the Williams *et al.* reference does not disclose or suggest the special catalysts employed to obtain the beneficial characteristics of the benzoic acid esters achieved with the process of Applicants' invention, and therefore cannot cure the deficiencies of the Eckey reference.

Reconsideration and withdrawal of this rejection is respectfully requested.

Applicants believe they are therefore entitled to an allowance of their Application and earnestly solicit such favorable action by the Examiner.

The Examiner is respectfully requested to telephone the undersigned attorney if any further questions remain which can be resolved by a telephone interview

Respectfully submitted,
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January 23, 2008
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